

San Diego Astronomy Association

Celebrating Over 50 Years of Astronomical Outreach



September 2024

September 11th Program

<https://www.sdaa.org/>

A Non-Profit Educational Association
P.O. Box 23215, San Diego, CA 92193-3215

Next SDAA Business Meeting

September 10th at 7:00pm
10070 Willow Creek Rd
San Diego, CA 92131
Via Zoom

Next Program Meeting

September 11th
Mission Trails Regional Park
Visitor and Interpretive Center
1 Father Junipero Serra Trail

Topic: Science in Space at the ISS National Laboratory
Speakers: Matt Pokross and Christina Cuttitta

Is there really a “US National Laboratory” orbiting above that non-NASA scientists can utilize for their research? The answer is, Yes! It’s called the International Space Station National Laboratory, (ISSNL), and it’s been in operation since 2005. Join us September 11th, to hear from two scientists, Matt Pokross and Christina Cuttitta, whose experiments have traveled to the ISSNL

via SpaceX Dragon over the past two years. Matt and Christina are experts in the field of structural biology - the study of biological molecules and macromolecules in 3D. Learn how challenging it is to crystallize a protein, why it’s necessary, and if successful, how it’s just the beginning of the process. The next step involves subjecting the crystals to powerful x-rays generated by synchrotron light sources, located world-wide, which are capable of producing intense beams of light more than a million times brighter than the sun! We hope you join us to hear the experience of two structural biologists working to discover new drugs mixed with a bit of space travel.



Please note, since our speakers are on the east coast, their presentation will start promptly at 7pm. Please plan to join the Zoom meeting on-time.

Read about the ISSNL here: <https://www.issnationallab.org/>

Read about protein crystallization here: https://en.wikipedia.org/wiki/Protein_crystallization

Read about X-ray crystallography here: https://en.wikipedia.org/wiki/X-ray_crystallography#Biological_macromolecular_crystallography

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Incorporated in California in 1963

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Newsletter Deadline

The deadline to submit articles for publication is the **15th** of each month.

The meeting will be held via Zoom.

See <https://sdaa.org/program-meeting/>

<https://us02web.zoom.us/join/zoom-join?z=9072282282&pwd=SDAA2024>

Link to SDAA Merchandise Store <https://sdaa28.wildapricot.org/SDAA-Store>

Link to Outreach Calendar https://calendar.google.com/calendar/embed?src=g-calendar@sdaa.org&ctz=America/Los_Angeles



San Diego Astronomy Association

San Diego Astronomy Association Board of Directors Meeting August 13, 2024 – Unapproved and subject to revision

1. Call to Order

The meeting was held via Zoom and was called to order at 7:12pm with the following board members in attendance: Dave Decker, President; Bee Pagarigan, Vice President; Mike Chasin, Treasurer; Gene Burch, Recording Secretary; David Wood, Corresponding Secretary; Hiro Hakozaki, Director; Kin Searcy, Director; Steve Myers, Director; Gracie Schutze, Director. Also in attendance were members Dan Kiser, JSF committee; Bill Cecil, JSF committee, Tom Kennedy, Site Maintenance committee and Prascilla Morquecho.

Dave Decker and Mike Chasin reported that the vote to approve or reject our updated Articles of Incorporation and Bylaws ended on July 31st. Both were approved overwhelmingly, with over 99% of the votes in favor of approval. A motion was made for the Board of Directors to accept the vote and to have our attorney file the appropriate documents. The motion was seconded and unanimously approved.

2. Approval of Last Meeting Minutes

The July meeting minutes were approved.

3. Treasurers & Membership Report

Mike reported that membership was up a bit last month and he is working with Dan and Bill to reconcile the JSF income and expenses. He reminded us that JSF expenses and income are recorded in two different fiscal years. The insurance for both SDAA and SDAAF have been paid. The Treasurer's report was approved.

4. Standard Reports

a. Site Maintenance Report:

Power has been restored to The Lipp building, bathrooms, and public pads.

b. Observatory:

We have had a couple of excellent star parties recently. Scope and DSC's are working exactly as they should. We made some changes to the wiring which has improved the accuracy. I have also replaced the Telrad and will do the same to the diagonal. Both predate my exposure to the scope in 2004 – replacement is more than due. With respect to the power, I am delighted to have it restored – thank you.

c. Loaner Scope Report:

Ten loaner scopes, one battery box, and a camera are all currently loaned out. Two more scopes will be picked up by members on August 3, with one returned.



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A generous donation from member Cheng Wang included an 8-inch f/12 Zerochromat folded refractor and a double-stacked Coronado PST. The PST will be added to the loaner inventory.

All of the eyepiece kits are loaned out, despite four telescopes still remaining in inventory. One member had to be turned away from loaning a scope due to lack of eyepieces. Budget was approved to purchase additional eyepiece kits. Three semi-premium kits have been selected to purchase:

XWA Kit - 100 and 82 degree ultra-wides, for ~f/4.7 scopes

- AstroTech XWA 100deg 20mm \$299
- AstroTech XWA 100deg 13mm \$279
- AstroTech UWA 82deg 7mm \$99
- AstroTech UWA 82deg 4mm \$99

Pretty much every review I've found about the AstroTech ultra-wides are positive. The XWA line is even compared favorably against the mighty Ethos!! So, for the money I think this will be a fantastic kit. As the pricing is similar, I went back and forth about whether to buy *two* of these kits, and skip the Hyperion kit below. I'm still able to be swayed either way, if you have an opinion.

Hyperion Kit - Carefully selected Baader Hyperion set, for ~f/6 scopes

- Baader Hyperion Aspheric 31mm \$226
- Baader Hyperion 21mm \$169
- Baader Hyperion 13mm \$169
- Baader Hyperion 5mm \$169

I carefully chose this selection to avoid the 24mm Hyperion, which is well known to be the worst of the series. The others in the Hyperion series are quite good, especially the light transmission due to the proprietary Baader Phantom coatings. When used in f/6 or slower scopes, this set should put up marvelous views.

65-degree Kit - General purpose kit for f/6 or f/10 scopes

- Baader Hyperion Aspheric 36mm \$239
- AstroTech Paradigm 25mm \$65
- AstroTech Paradigm 15mm \$65
- AstroTech Paradigm 8mm \$65
- Celestron X-Cel LX 5mm \$99

The AstroTech Paradigm eyepieces include a high index Lanthanum glass element to reduce false color and are very well regarded "premium budget" eyepieces. This set will work well with a wide range of scopes (though better in slower scopes, like our most common 8" f/6 Dobs).



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d. Private Pad Report:

Mark Smith reported that he's working on 4 new leases now and may be writing one or two more in the next month. The number of new leases would have been higher but some people are putting off the decision to lease a pad until there is more firm information on the grid and the new rules for the connecting private pads to the grid. After the 4 new leases are done, we will have 6 unleased pads and 10 people on the waiting list.

Private Pad Policy Review Committee Hakozaki/Schutze/Myers/Smith/Pagarigan Tasks to be completed by Committee

- Website private pad photos, visible to public, need to be updated.
- A photo catalog of the inside of private pad structures to be completed to satisfy annual audit of structures per current lease agreement statement 6 and 10 (photos will not be posted publicly).
- Method to track remote pad owner annual usage.
- Clarification of pad transfer process to ensure waiting list is honored.
- Identify all pads with reflective numbers posted on a permanent rebar stake or similar
- Inspection and evaluation report of all pad areas

The Sunday, July 21, 2024, 10AM in-person work meeting at TDS was postponed due to high temperatures. The next meeting of the committee is TBD.

e. Program Meetings Report:

- Rob Zelle from NASA/JPL, a returning speaker who ran the Exoplanet Watch program, will be the August 2024 program speaker.
- Speakers for Science in Space at the ISS National Laboratory confirmed for September 11, 2024.
- The October speaker slot remains open.
- Brainstorming ideas for enhancing program meetings in 2025.

Important note – the September program meeting will be held on September 11th, which is the second Wednesday of the month.

f. AISIG Report:

No meeting was held in July. Several members have expressed interest in getting together for an "in person" meeting in August. We are also working with Palomar observatory in putting together a program called "Shadow the Scientist" that would allow SDAA AISIG members to join a Zoom session with the P200 control room. A moderator would pass chat questions to the night's observer during slack times of data collection on the P200.

g. Newsletter Report:

Nothing new to report this month, but as always Andrea is doing a great job.



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h. Website Report:

The voting countdown timer was removed after it finished counting down. Nothing else new to report. Please send information on future programs as soon as they are available. JSF was a great event!

i. Social Media:

SDAA Social Media Committee Charter Members:

Francisco Contreras, Danielle Nadeau, Pagarigan, Flynn

SDAA Social Media Committee Charter – WIP, overall goal is to increase SDAA club exposure to draw interest and increase membership

Current Status of SDAA Social Media Accounts:

- Instagram, 537 Followers (and concurrently with Threads, a Twitter-like replacement at 72 Followers) - Active
- YouTube, 642 Subscribers - Active
- Facebook Public, Private 440 members - Active
- Twitter (“X”) 124 Followers – Not Active (Last SDAA Admin post in 2021), suggest abandoning this app for now
- Feedback from numerous SDAA members indicate that it would benefit the club to have a greater social media presence. Most of the activity is on FB via member-posted astrophotography. We could do a better job routinely highlighting more of the club assets such as TARO, CRUZEN, The LIPP, loaner scope program, and photos/videos of weekly outreach events.

Work-in-Progress Goals

- Establish an SDAA Social Media Committee – a few SDAA members who are currently active in the club have expressed interest in joining the effort.
- Write a simple committee charter for board approval to include overall mission and short-term goals, i.e., consistency of engagement, feature club assets regularly to gain new members, post outreach event photos/short videos, etc.
- Decide which social media sites to add as we gain committee members to share responsibilities
- Confirm and update SDAA Asset sheet with all usernames and passwords

j. Outreach Report:

We didn't have to cancel any of our July events, although there were two events that were clouded out that we just *'plowed through'* anyways. Stars-in-the-Park, July 3rd and Camp Beyond the Scars, July 10th were those two. We changed lemons into lemonade by reverting to 'hands-on astronomy' by explaining how our telescopes work and letting the public try their hand at using the spotter scopes and aiming at street lights or tops of flag poles.

We rarely get the opportunity to make presentations at libraries, and San Marcos Public Library was a special treat in that 90% of the audience were under 10 years old. William Heise County Park by Julian was another treat for SDAA, because of the dark night sky, an opportunity to show



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the general public where the Milky Way is! We're noticing a downward trend in attendance at the three Mission Trails locations, perhaps the public isn't reading the social media announcements?

Here are the numbers for July:

2024	Previous Total	July	YTD
Completed	32	10	42
Canceled	25	0	25
Total Attendance	3543	419	3962

k. TARO Report:

Operations have been limited by high temps at TDS as most nights are too warm to allow proper camera cooling. There have been several minor issues with the software that runs the system. All the primary software has now been updated with current versions with the goal of eliminating those issues.

Stats:

9 current projects, 180 hours of imaging time

9 current projects, 180 hours imaging time

1 project completed, 1 project added.

Currently working with two members on new imaging projects.

3 new TARO archive requests. At this time 55 members have access to the files.

l. Cruzen Report:

Cruzen was utilized one time in July, but spent most of the month unavailable due to the TDS power cutoff. Cruzen reservations will resume as soon as power is restored to observatory row. The facility remains in good condition.

The Cruzen Director (Paul Krizak) is seeking to transfer management of Cruzen to another member. Interested members should reach out to the club leadership. A current Cruzen certified member with experience using the facility would be ideal. The Board has begun their search and is actively seeking volunteers.

m. Merchandise Report:

A few more items were sold last month. Inventory is getting low and we'll need to reorder soon.



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n. Astronomical League Report:
Nothing new.

o. JSF Report:

Request from the Board from the JSF Committee, what do you want JSF to be?

- A. Is it to be an exclusive club event?
- B. Is it to a fund raiser for the club?
- C. Is it to be a public outreach event and charge the public for admission?
- D. Other?

1. JSF Attendance: Attendance with down compared to last year most likely due to the extreme heat. Temperatures reached 100 both days. Two paid visitors to Palomar did not attend out of 20 guests. 39 campers and 7 RV paid reservations did not attend JSF. 75 sites were used with approximately 152 participants.
2. Public Outreach: Far fewer of the public attended Saturday night than the year before, again probably due to the weather. However, SDAA member Dennis Ammann felt it was comparable or maybe less to previous years.
3. Restaurants: Probably one of the more difficult efforts is finding food vendors. Arlene Smith was key in finding the vendors we did secure. The Purple Owl Café backed out the day before the event and the Nandri Indian Café came but was there only for a short time then left to tend to their restaurant. I later met with the owner who apologized and promised to attend next year. The Rafikiz Foods was there both nights and most found the food delicious.
4. Financial: Still a work in progress:

Expenses were running approximately	\$ 5,500
Revenue was approximately	\$11,500

Things that went well:

1. ACE parking kept things organized and parking was better controlled.
2. Designated public scope area with red rope light was easily accessible for visitors. It was hoped by designating a specific public area it might keep visitors out of the camping area so campers could concentrate on their own interests. That area should be made larger as the area was a bit too crowded.
3. The call for volunteers to the general membership was very successful as we had a sufficient number to handle the various tasks.
4. Price increase to encourage earlier registration. There didn't seem to be any objection to the price increases.
5. Signage directed visitors to various items, concessions, registration, parking, etc.

Things that didn't do well:

1. The shower stall became a muddy mess and parts began to fall apart. The shower was discarded so something will have to be done next year if we are to offer a shower.



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2. Better countdown on available spaces for campers and RV's. When it sells out it needs to clearly state so on line. Received dozens of questions how to register when the event was sold out.
3. The projector is not bright enough for lectures at 7:00. Either a brighter projector or a monitor to allow lectures during the afternoon. Need input from those more experienced in this area.

Suggestions for next year.

1. Sell camping slots, not people. For example, a camper with 3 would pay more than an RV.
2. Raise prices in general. \$50 for campers, \$125 for RV. One-month prior raise to \$60 and \$150. Observatory tour \$50.
3. Define RV as A, B, C, Fifth Wheel or trailer. No RV larger than 26 feet. Teardrop will be considered a tent space.
4. Modify the website to have a countdown of remaining spaces. See #2 above.
5. Cap the registration to 80 campers and 20 RV's max.
6. Consider getting a restroom/shower trailer.
7. Call on the members to volunteer to do a lecture during the afternoon.
8. Call on volunteers to create a strong JSF Committee. Distribute the effort around to members of the committee, organize the event and commit to completing all the tasks. For example, there are more than 20 separate tasks to complete in order to make the application to the County and to put on this event.
9. Consider getting an outside firm to conduct the registration process.
10. Get a security company for both days.
11. Ask more vendors to participate by sending representatives and setting up a booth at least for Saturday night.
12. Board to recommend which observatory to attend in 2025.

p. Grid: Discussion, Options, Mitigation:

3 representatives of Neal Electric visited the site on July 31st. About 2.5 hours were spent on site. We expect a quote submission in the next 2 weeks. The Contracts committee met briefly via Zoom on Thursday August 1st. We reviewed the current RFP and a few suggested changes were discussed. Neither of the two proposals include Performance and Payment bonds. We also discussed requiring more detailed staging plans to be included in the final quotes. The ability of the selected contractor to provide a service/maintenance agreement will be added as part of the final selection of a contractor.

No Board actions are needed at this time.



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5. Old Business:

- a. Membership Portal – GROWS: still working on a Google Form for members to make suggestions Chasin
- b. Cruzen Director status: We're still looking for someone to replace Paul as the Cruzen Director Decker
- c. Power Supply for private pads: On hold pending more discussion Pagarigan
- d. Other Old business – none Decker

6. New Business:

- a. Audit Committee: Chasin will put out email looking for volunteers Chasin
- b. Local Storage Facility: Bee reported that we now have a storage facility in the Miramar area. Pagarigan
- c. Contest for new SDAA Logo and/or Letterhead: Bee reported that so far, we have had 3 people express interest in submitting designs Pagarigan
- d. Banquet Date/Venue: A tentative date of January 11, 2025 has been set for our annual banquet. Chasin
- e. Annual BBQ date: The annual Fall BBQ at TDS is tentatively set for October 5th Decker
- f. TDS Site Usage Policies/Legal Review: Mike is working with our law firm to come up with a policy regarding member use at TDS. Any for profit use could threaten our non-profit/tax exempt status. Chasin
- g. Other new business: None Decker
- h. Board of Directors Closed Session: Dave asked non-board members to log off the Zoom meeting so the Board could hold a closed session. Decker

7. Adjournment: The meeting was adjourned at 8:21pm.

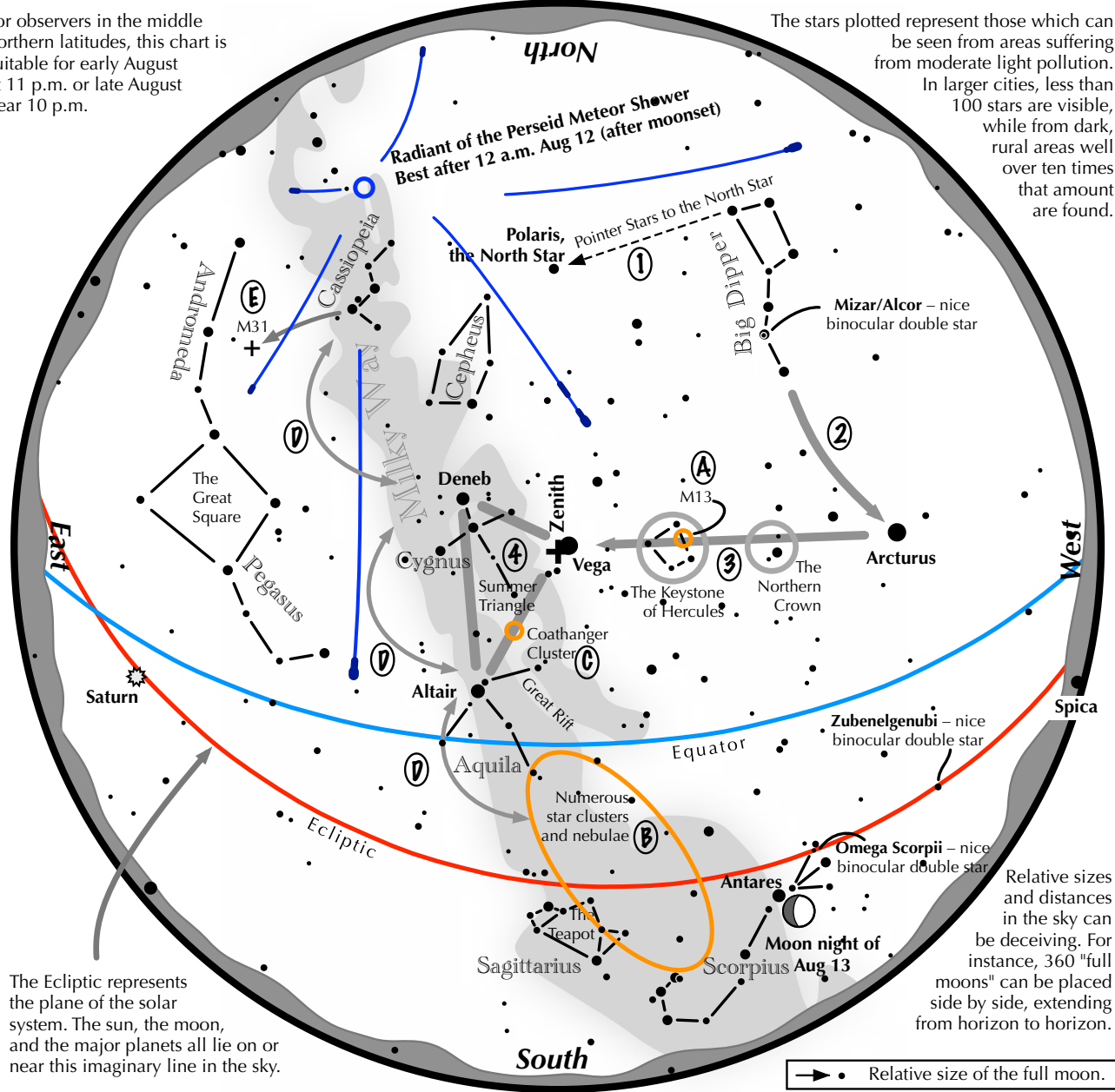


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Navigating the mid August Night Sky

For observers in the middle northern latitudes, this chart is suitable for early August at 11 p.m. or late August near 10 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

Navigating the mid August night sky: Simply start with what you know or with what you can easily find.

- 1 Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
- 2 Follow the arc of the Dipper's handle. It intersects Arcturus, the brightest star in the June evening sky.
- 3 To the northeast of Arcturus shines another star of the same brightness, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.
- 4 High in the East lies the summer triangle stars of Vega, Altair, and Deneb.

Binocular Highlights

- A: On the western side of the Keystone glows the Great Hercules Cluster.
- B: Between the bright stars Antares and Altair, hides an area containing many star clusters and nebulae.
- C: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
- D: Sweep along the Milky Way for an astounding number of faint glows and dark bays, including the Great Rift.
- E: The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.



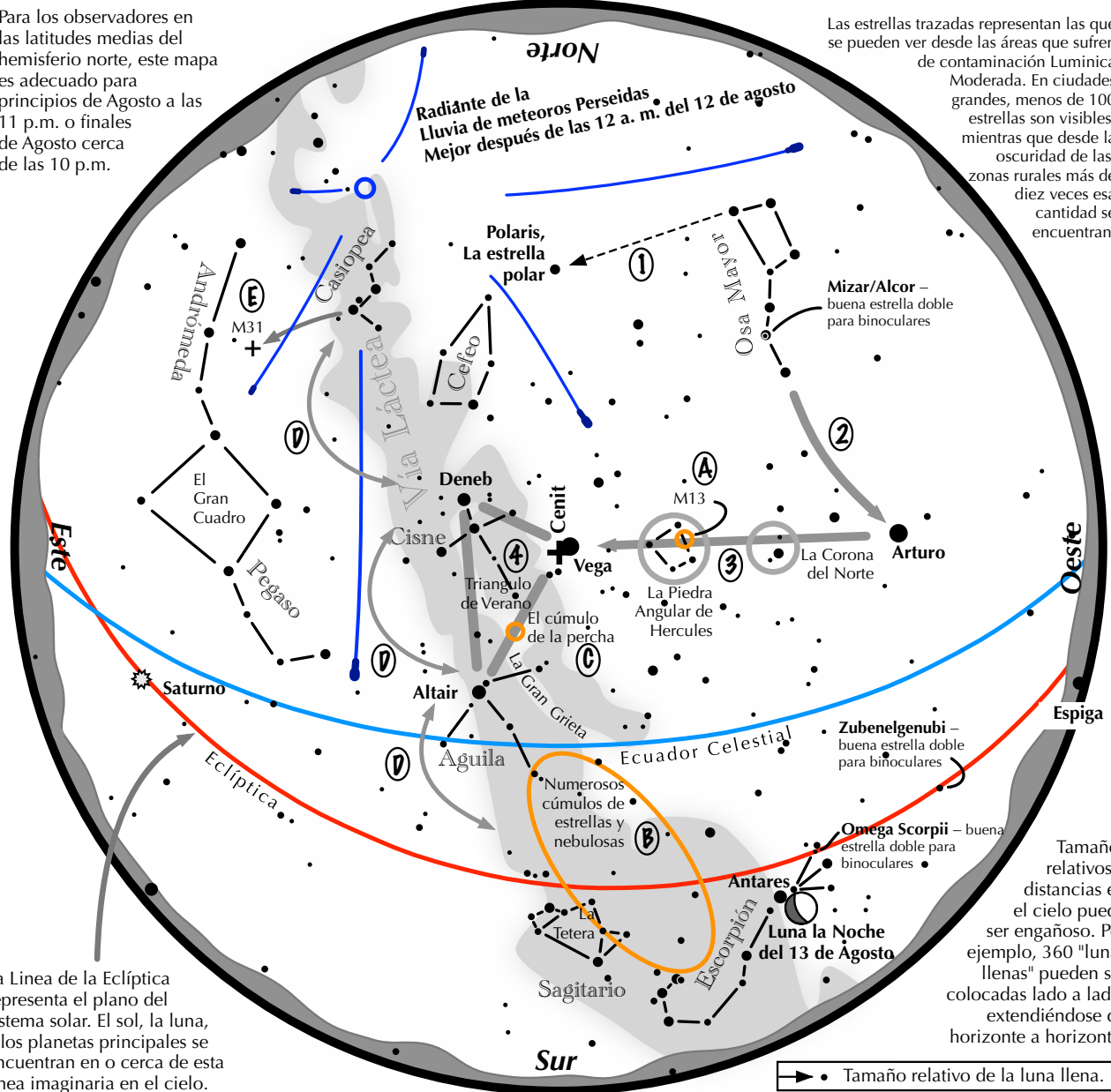


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Navegando por el cielo nocturno de Agosto

Para los observadores en las latitudes medias del hemisferio norte, este mapa es adecuado para principios de Agosto a las 11 p.m. o finales de Agosto cerca de las 10 p.m.

Las estrellas trazadas representan las que se pueden ver desde las áreas que sufren de contaminación Luminica Moderada. En ciudades grandes, menos de 100 estrellas son visibles, mientras que desde la oscuridad de las zonas rurales más de diez veces esa cantidad se encuentran.



La Línea de la Eclíptica representa el plano del sistema solar. El sol, la luna, y los planetas principales se encuentran en o cerca de esta línea imaginaria en el cielo.

Tamaños relativos y distancias en el cielo puede ser engañoso. Por ejemplo, 360 "lunas llenas" pueden ser colocadas lado a lado, extendiéndose de horizonte a horizonte.

● Tamaño relativo de la luna llena.

Navegando por el cielo nocturno: simplemente comience con lo que sabe o con lo que puede encontrar fácilmente.

- 1 Haz una línea hacia el norte desde las dos estrellas en la punta de la Osa Mayor. Pasa por Polaris, la estrella polar.
- 2 Siga el arco del mango del tazón de la Osa Mayor, continúa hacia Arturo, luego continúa hacia Espiga.
- 3 Dibuja una línea desde Arturo a Vega. Un tercio del camino se encuentra "La Corona del Norte". Dos tercios de esa distancia llevan a la "piedra angular de Hércules." Se necesita un cielo oscuro para ver estas dos configuraciones estelares tenues.
- 4 En lo alto del este se encuentran las tres estrellas brillantes del Triángulo de verano: Vega, Altair y Deneb.

Puntos destacados con binoculares

A: En el lado occidental de la Piedra Angular de Hércules. **B:** Entre las brillantes estrellas Antares y Altair, se esconde un área que contiene muchos cúmulos de estrellas y nebulosas. **C:** Casi a la mitad de la distancia entre Altair y Vega, Brilla la "Percha," un grupo de estrellas que describe un perchero.

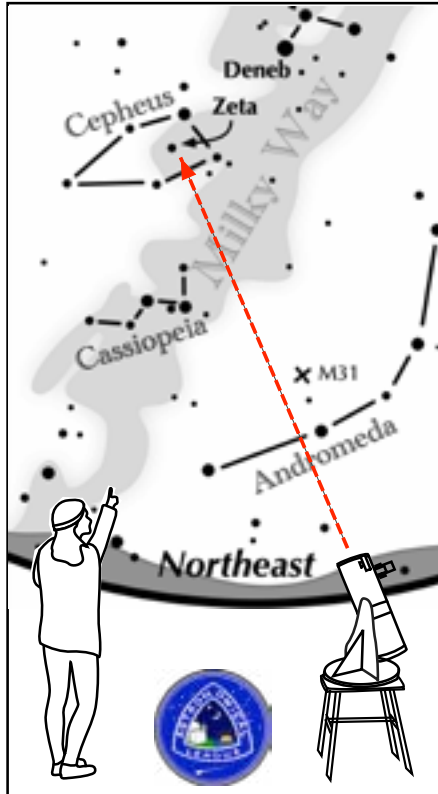
D: Recorre la Vía Láctea en busca de un número asombroso de destellos tenues y bahías oscuras, incluido La Gran Grieta. **E:** Las tres estrellas más occidentales de las "W" de Casiopea apuntan hacia el sur hasta M31, la Galaxia de Andromeda, un óvalo "borroso."





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ASTRONOMICAL LEAGUE Double Star Challenge



Other Suns: Zeta Cephei

How to find Zeta Cephei on an August evening

Find the stars forming the house shape of Cepheus, which is the constellation above Cassiopeia in the early evening in August. Zeta is the central star in the southerly portion of the house shape of Cepheus.

Suggested magnification: >50x
Suggested aperture: >3 inches

Zeta Cephei

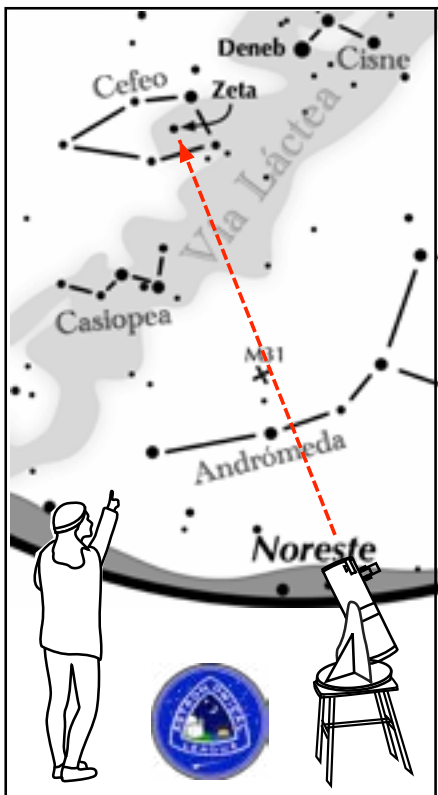
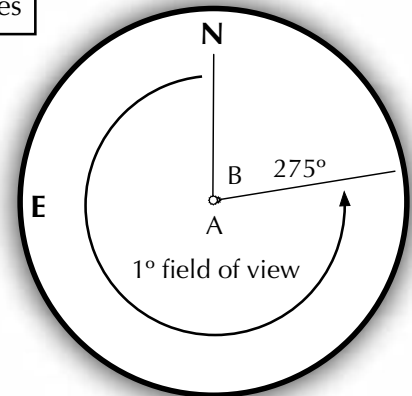
A-B separation: 7.9 sec

A magnitude: 4.4

B magnitude: 6.4

Position Angle: 275°

A & B colors: white & blue



Otros Soles: Zeta Cephei

Cómo encontrar Zeta Cephei en una tarde de agosto

Encuentra las estrellas que forman la forma de casa de Cefeo, que es la constelación sobre Casiopea a primera hora de la tarde de agosto. Zeta es la estrella central en la parte sur de la forma de la casa de Cefeo.

Ampliación sugerida: >50x,
Apertura sugerida: >75 mm

Zeta Cephei

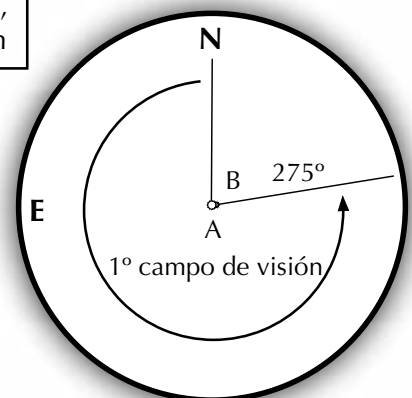
A-B separación: 7.9 sec

A magnitud: 4.4

B magnitud: 6.4

PA: 175°

A & B colores: blanca & azul



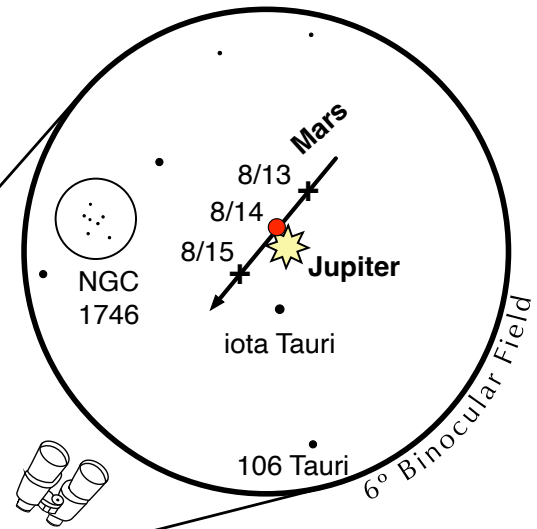
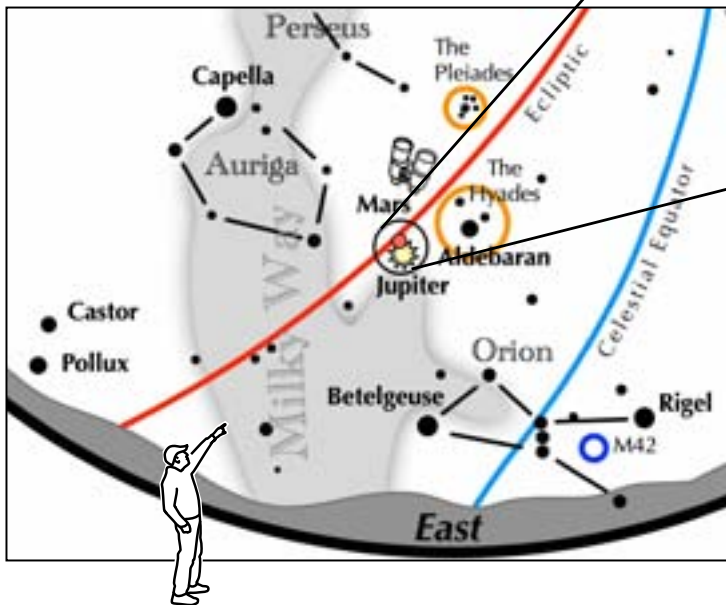


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If you can view only one celestial event this month, view this one.

A slowly brightening Mars passes immediately north of the much brighter Jupiter.

1. Look to the east 90 minutes before sunrise on August 13, 14, and 15.
2. Find Mars and Jupiter shining left of the red star Aldebaran. Mars' brightness will nearly match that of Aldebaran.



Binocular View

3. Aim binoculars at Mars and Jupiter.
4. On the morning of August 14, they will be only 20 minutes apart.
5. They will be just 1.5° southwest of the open cluster NGC 1746.
6. A telescope at > 100 power will reveal Mars' tiny red disk and Jupiter's larger disk along with its four Galilean moons.





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Astronomical League Notes

By Mark Smith

Last month, I introduced you to a couple of Astronomical League Observing Programs. This month, I'd like to introduce you to one observing program and some of the resources available through the club.

When I first started working on some of the Observing Programs, I picked up the Lunar Program because I thought "Hey, this will be an easy one to knock out." I was quite wrong, but in a good way. This is one of the programs that has you using Naked Eye, Binoculars, and Telescopic observing, although you can use a different type of observing than what is "required" if you are having a hard time finding an object (can't find a crater in your Binoculars? You can use a Telescope.). This program has you doing everything from observing a very young (and very old) moon, finding the Man in the Moon and finding the various Maria all the way to finding individual mountains, valleys, and craters, some of which are really only easily visible at certain phases of the moon. In the process, you learn a LOT about the moon and find yourself intrigued by the incredible detail of our closest celestial companion. The league has an excellent pamphlet on the Moon that really helps you work through this program and a good moon map is a must. This is a program that is doable by a novice observer but that an expert will still find some challenge in.

The Astronomical League Website offers many resources that may be useful to any level of observer. Some of the items published in this newsletter are available for free in digital form on the website (the monthly sky maps, for example) and all the observing lists are freely available on the website if you are looking for ideas of things to find in the sky. The League puts out an excellent quarterly magazine which is also freely available online. If you are looking for something a little more specific or in-depth, head on over to the store. In addition to the usual observing aids, they offer a variety of books and pamphlets. The meat of the store is, in my opinion, located in the Books and Calendars section where you can find observing journals, instructions for building a back yard observatory and more and the Observing Manuals section which has detailed observing information (often related to the Observing programs but interesting and informative even without those programs) on everything from the Moon and Mars to Carbon Stars and Galaxy Groups. The materials are all relatively cheap and universally informative.

If you are interested in what you've read, I invite you to explore what the Astronomical League has to offer and use it to help guide or enrich your astronomy. You may even decide to join the next time you renew your SDAA membership. If you have any questions about the Astronomical League, please don't hesitate to contact me at ALCOR@SDAA.org.



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NASA COMMUNITY COLLEGE SYMPOSIUM

Funded by the ASU SCoPE Program
in collaboration with

Fleet Science Center
Sept. 8th 2024 11:00 - 3:00 pm PST

**PLANETARIUM
SHOWING**
With Lisa Will

KATARINA YOCUM
Cometary Astrochemistry & Astrobiology
Research Assistant Professor at American
University and NASA Goddard Space Flight Center

SPENCER RAINES
Mars Mission Operations Specialist
Missions Operations Specialist at Malin Space
Science System

ANNA ROSEN
Computational Astrophysicist with an Emphasis in
Star and Star Cluster Formation
Assistant Professor, Department of Astronomy, San
Diego State University

PRESENTATIONS
With Panelists

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CMB-S4 Online High School Course

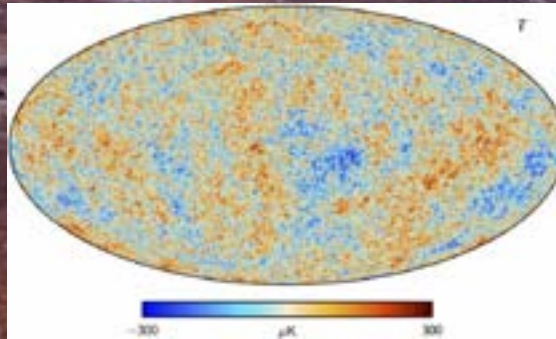


The CMB-S4 collaboration invites you to test a free high school astrophysics course covering the following topics

- The Big Bang
- The Cosmic Microwave Background
- Dark Matter
- Dark Energy

Watch short videos and answer questions to earn a Certificate of Participation upon the completion of each module.

Access the course here: <https://cmb-s4.org/outreach/high-school-course/>



For inquiries contact
crowellj@uchicago.edu

<https://cmb-s4.org/outreach/high-school-course/>



San Diego Astronomy Association

SDAA Contacts

Club Officers and Directors

President	Dave Decker	President@sdaa.org	(619) 972-1003
Vice President	Bee Pagarigan	VicePresident@sdaa.org	(760) 703-6183
Recording Secretary	Gene Burch	Recording@sdaa.org	(858) 926-9610
Treasurer	Mike Chasin	Treasurer@sdaa.org	(858) 210-1454
Corresponding Secretary	Dave Wood	Corresponding@sdaa.org	(858) 735-8808
Director Alpha	Steve Myers	DirectorAlpha@sdaa.org	
Director Beta	Hiro Hakozaki	DirectorBeta@sdaa.org	(858) 869-9507
Director Delta	Gracie Schutze	DirectorDelta@sdaa.org	(619) 857-0088
Director Gamma	Kin Searcy	DirectorGamma@sdaa.org	(858) 586-0974

Committees

Site Maintenance	Committee	TDS@sdaa.org	
Observatory Director	Ed Rumsey	Observatory@sdaa.org	(858) 722-3846
Private Pads	Mark Smith	Pads@sdaa.org	(858) 484-0540
Outreach	Dennis Ammann	Outreach@sdaa.org	(619) 247-2457
N. County Star Parties	-Vacant-	NorthStarParty@sdaa.org	
S. County Star Parties	-Vacant-	SouthStarParty@sdaa.org	
E. County Star Parties	Dave Decker	EastStarParty@sdaa.org	(619) 972-1003
Central County Star Parties	Dennis Ammann	CentralStarParty@sdaa.org	(619) 247-2457
Camp with the Stars	-Vacant-	CampWiththeStars@sdaa.org	
K.Q. Ranch Coordinator	Dennis Ammann	KQ@sdaa.org	(619) 247-2457
Newsletter	Andrea Kuhl	Newsletter@sdaa.org	
New Member Mentor	Dan Kiser	Mentor@sdaa.org	(858) 922-0592
Webmaster	Jeff Stevens	Webmaster@sdaa.org	(858) 566-2261
AI SIG	Dave Wood	AI SIG@sdaa.org	
Site Acquisition	-Vacant-	SecondSite@sdaa.org	
Field Trips	-Vacant-	FieldTrips@sdaa.org	
Grants/Fund Raising	-Vacant-	Grants@sdaa.org	
Julian StarFest	Bill Cecil	info@julianstarfest.com	
Merchandising	Gene Burch	Merchandising@sdaa.org	(858) 926-9610
Publicity	Jeff Flynn	Publicity@sdaa.org	(619) 806-6505
Loaner Scopes	Paul Krizak	loanerscopes@sdaa.org	
Cruzen Observatory Director	Paul Krizak	cruzen@sdaa.org	
TARO Observatory Director	Dave Wood	TARO@sdaa.org	
TDS Network	Dave Wood	TDSNet@sdaa.org	(858) 735-8808
TDS Operations	Bee Pagarigan	TDS@sdaa.org	
ALCOR (Astronomical League Correspondent)	Dave Decker	ALCOR@sdaa.org	(619) 972-1003

SDAA Editorial Staff

Editor - Andrea Kuhl
since April 2011

newsletter@sdaa.org

Assistant Editor: Craig Ewing

Have a great new piece of gear? Read an astronomy-related book that you think others should know about? How about a photograph of an SDAA Member in action? Or are you simply tired of seeing these Boxes in the Newsletter rather than something, well, interesting?

Join the campaign to rid the Newsletter of little boxes by sharing them with the membership. In return for your efforts, you will get your very own byline or photograph credit in addition to the undying gratitude of the Newsletter Editor. Just send your article or picture to Newsletter@SDAA.Org.



This article is distributed by NASA's Night Sky Network (NSN).

The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

September's Night Sky Notes: Marvelous Moons

By Kat Troche

September brings the gas giants Jupiter and Saturn back into view, along with their satellites. And while we organize celebrations to observe our own Moon this month, be sure to grab a telescope or binoculars to see other moons within our Solar System! We recommend observing these moons (and planets!) when they are at their highest in the night sky, to get the best possible unobstructed views.

The More the Merrier

As of September 2024, the ringed planet Saturn has 146 identified moons in its orbit. These celestial bodies range in size; the smallest being a few hundred feet across, to Titan, the second largest moon in our solar system.



The Saturnian system along with various moons around the planet Saturn: Iapetus, Titan, Enceladus, Rhea, Tethys, and Dione. Credit: Stellarium Web

Even at nearly 900 million miles away, [Titan](#) can be easily spotted next to Saturn with a 4-inch telescope, under urban and suburban skies, due to its sheer size. With an atmosphere of mostly nitrogen with traces of hydrogen and methane, Titan was briefly explored in 2005 with the [Huygens](#)



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[probe](#) as part of the [Cassini-Huygens mission](#), providing more information about the surface of Titan. NASA's mission [Dragonfly](#) is set to explore the surface of Titan in the 2030s.



This mosaic of Saturn's moon Enceladus was created with images captured by NASA's Cassini spacecraft on Oct. 9, 2008, after the spacecraft came within about 16 miles (25 kilometers) of the surface of Enceladus. Credit: NASA/JPL/Space Science Institute

Saturn's moon [Enceladus](#) was also explored by the Cassini mission, revealing plumes of ice that erupt from below the surface, adding to the brilliance of Saturn's rings. Much like our own Moon,



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Enceladus remains tidally locked with Saturn, presenting the same side towards its host planet at all times.

The Galilean Gang

The King of the Planets might not have the most moons, but four of Jupiter's 95 moons are definitely the easiest to see with a small pair of binoculars or a small telescope because they form a clear line. The Galilean Moons – Ganymede, Callisto, Io, and Europa – were first discovered in 1610 and they continue to amaze stargazers across the globe.



The Jovian system: Europa, Io, Ganymede, and Callisto. Credit: Stellarium Web

- [Ganymede](#): largest moon in our solar system, and larger than the planet Mercury, Ganymede has its own magnetic field and a possible saltwater ocean beneath the surface.
- [Callisto](#): this heavily cratered moon is the third largest in our solar system. Although Callisto is the furthest away of the Galilean moons, it only takes 17 days to complete an orbit around Jupiter.
- [Io](#): the closest moon and third largest in this system, Io is an extremely active world, due to the push and pull of Jupiter's gravity. The volcanic activity of this rocky world is so intense that it can be seen from some of the largest telescopes here on Earth.
- [Europa](#): Jupiter's smallest moon also happens to be the strongest candidate for a liquid ocean beneath the surface. NASA's [Europa Clipper](#) is set to launch October 2024 and will determine if this moon has conditions suitable to support life. Want to learn more? Rewatch the July 2023 Night Sky Network webinar about Europa Clipper [here](#).



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Be sure to celebrate [International Observe the Moon Night](#) here on Earth September 14, 2024, leading up to the super full moon on September 17th! You can learn more about supermoons in our mid-month article on the [Night Sky Network](#) page!

2024 TDS Star Party Schedule

Date	Type	Sunset	Astro. Twi.	Moonrise(set)	Closing	Illumination
Jan-06-24	Public	4:57 PM	6:24 PM	3:07 AM	9:30 PM	26.5%
Jan-13-24	Member	5:03 PM	6:30 PM	(7:50 PM)	9:30 PM	8.5%
Feb-03-24	Public	5:22 PM	6:47 PM	1:55 AM	9:30 PM	44.0%
Feb-10-24	Member	5:29 PM	6:52 PM	(6:39 PM)	9:30 PM	1.4%
Mar-02-24	Public	5:47 PM	7:09 PM	12:46 AM	10:00 PM	61.4%
Mar-09-24	Member	5:52 PM	7:14 PM	5:52 AM	10:00 PM	0.6%
Apr-06-24	Member	7:12 PM	8:37 PM	5:20 AM	11:00 PM	6.0%
Apr-27-24	Public	7:27 PM	8:57 PM	11:36 PM	11:00 PM	88.3%
May-04-24	Member	7:33 PM	9:04 PM	4:20 AM	11:30 PM	16.0%
May-11-24	Public	7:38 PM	9:12 PM	(11:53 PM)	11:30 PM	17.7%
Jun-01-24	Public	7:51 PM	9:31 PM	2:50 AM	11:30 PM	28.5%
Jun-08-24	Member	7:55 PM	9:36 PM	(10:31 PM)	11:30 PM	6.8%
Jul-06-24	Member	7:59 PM	9:40 PM	(9:07 PM)	11:30 PM	1.1%
Jul-27-24	Public	7:50 PM	9:24 PM	11:58 PM	11:30 PM	56.6%
Aug-03-24	Member	7:44 PM	9:17 PM	(7:44 PM)	11:30 PM	0.6%
Aug-31-24	Public	7:13 PM	8:38 PM	4:59 AM	11:00 PM	5.2%
Sep-07-24	Public	7:04 PM	8:28 PM	(9:20 PM)	11:00 PM	20.0%
Sep-28-24	Member	6:36 PM	7:58 PM	3:52 AM	10:30 PM	14.5%
Oct-05-24	Member	6:27 PM	7:48 PM	(7:54 PM)	10:30 PM	8.6%
Oct-26-24	Public	6:02 PM	7:25 PM	2:42 AM	10:30 PM	28.1%
Nov-02-24	Public	5:56 PM	7:19 PM	(6:30 PM)	10:00 PM	1.7%
Nov-30-24	Member	4:42 PM	6:09 PM	7:11 AM	9:30 PM	0.4%
Dec-21-24	Public	4:47 PM	6:15 PM	11:15 PM	9:30 PM	63.2%
Dec-28-24	Member	4:51 PM	6:19 PM	6:00 AM	9:30 PM	5.2%

SDAA is now registered with the employer fund-matching platform Benevity. If your workplace offers matching charitable donations for non-profits and uses Benevity to distribute funds, you can now designate the San Diego Astronomy Association. Thank you for supporting the SDAA!

MEMBERSHIP INFORMATION

Send dues and renewals to P.O. Box 23215, San Diego, CA 92193-3215 or renew on-line. The notice that your membership in SDAA will expire is sent by email. Dues are \$60 for Contributing Memberships; \$40 for Basic Membership; \$70 for Private Pads; \$5 for each Family membership.